

# PATENT ABSTRACTS OF JAPAN

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## (54) DEVICE AND METHOD FOR PROGRAM INFORMATION RECORDING

### (57)Abstract:

PROBLEM TO BE SOLVED: To reflect the request from a user as well as the wishes of a program information producer and a broadcasting business owner by determining the priority for every program which becomes a subject for automatic recording the program which become the subject and reducing the amount of recorded data against the recorded program at prescribed timing.

SOLUTION: Received program data are successively and automatically recorded in a program information recording section 7. Similarly the program information received in synchronism with or asynchronously received with the program data are also successively recorded in the section 7. Then a program information index for each program is prepared by a program information management section 6 and recorded in the program information control section 6. The priority included in the index is determined based on the information such as the program information private information and the transmitting side set priority. In order to avoid the reduction in the amount of the data which are made possible for recording of the section 7 selectively erasing or a data change in terms of a program unit is executed.

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## CLAIMS

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### [Claim(s)]

[Claim 1] A priority determining means which is the received program information recording device which all records some programs automatically and became a

candidate for automatic recording and which determines the priority for every program. A program information recording device provided with a recording device which records a program used as said candidate for automatic recording and a control means processed for reducing record data volume in said recording device to predetermined timing based on said priority to a program recorded on said recording device.

[Claim 2] The program information recording device according to claim 1 wherein said priority determining means determines said priority based on personal information registered beforehand.

[Claim 3] The program information recording device according to claim 1 wherein said priority determining means determines said priority based on additional information over a program provided from the broadcasting station side and personal information registered beforehand.

[Claim 4] About a program with which it is satisfied of conditions defined beforehand said priority determining means. A program information recording device given in any 1 clause of Claims 1-3 giving a priority which shows that it forbids performing data conversion processing accompanied by reduction of deleting from said recording device in processing for reducing said record data volume and data volume.

[Claim 5] About a program by which recording reservation was carried out based on a user's operations said priority determining means. A program information recording device given in any 1 clause of Claims 1-3 giving a priority which shows that it forbids performing data conversion processing accompanied by reduction of deleting from said recording device in processing for reducing said record data volume and data volume.

[Claim 6] Said control means does not process to a program which has the 1st priority among programs recorded on said recording device. The program information recording device according to claim 1 deleting this about a program which performs data conversion processing accompanied by reduction in data volume to a program with the 2nd priority and has the 3rd priority.

[Claim 7] The program information recording device according to claim 6 updating a priority of an eliminated program to the 4th priority while updating a priority of a program which performed data conversion processing accompanied by reduction in data volume to the 3rd priority.

[Claim 8] The program information recording device according to claim 1 wherein said predetermined timing is the timing from which it was detected that the remaining recordable data volume in said recording device was less than a basis defined beforehand.

[Claim 9] The program information recording device according to claim 1 characterized by excepting from an object of automatic recording of this program when a program equivalent to a program which was the target of said automatic recording is already recorded on said recording device.

[Claim 10] Information about the contents of the partial program with this specific program that is a program information recording device which receives and records

a program constituted by two or more partial programs and is broadcast in advance of broadcast of a program of a broadcast schedule. Information about the contents of the partial program with other specific programs already recorded. A means to extract a specific partial program in which conditions about this personal information are satisfied best based on personal information registered beforehand. When said extracted specific partial program is what constitutes a program of said broadcast schedule. When it is that from which it outputs as it is when a program of this broadcast schedule is received and said extracted specific partial program constitutes said program of others already recorded. A program information recording device provided with a means to substitute a portion applicable when a program of this broadcast schedule is received for said extracted specific partial program and to output it.

[Claim 11] Information about the contents of the partial program with this specific program that is a program information recording device which receives and records a program constituted by two or more partial programs and is broadcast in advance of broadcast of a program of a broadcast schedule. Information about the contents of the specific partial program for [ each ] substitution added to one or more specific partial programs for substitution over a partial program of this specification broadcast in advance of broadcast of this program. A means to extract a specific partial program in which conditions about this personal information are satisfied best based on personal information registered beforehand. When said extracted specific partial program is what constitutes a program of said broadcast schedule. When said extracted specific partial program is a partial program specific [ for / said / substitution ] which outputs as it is when a program of this broadcast schedule is received. A program information recording device provided with a means to substitute a portion applicable when a program of this broadcast schedule is received for a specific partial program for said extracted substitution and to output it.

[Claim 12] Record a program which is the received program information record method which all records some programs automatically and became a candidate for automatic recording and which determined the priority for every program and became a candidate for automatic recording and to predetermined timing. A program information record method processing for reducing record data volume in said recording device based on said priority to a program recorded on said recording device.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the program information recording device and program information record method which perform record and distribution of a digital broadcasting program and information.

[0002]

[Description of the Prior Art]An individual a program etc. with the conventional VTR aiming at recording and playing. In order to record a program a user sets the channel of a tuner by the channel which is broadcasting the desired program. Timed recording for operating a recording button with a program start or specifying beforehand the specification matter about a recording channel, video recording start time, recording finish time and other recording needed to be operated.

[0003]The residue of recording media such as magnetic tape had to be checked a priori at the time of reservation of picture recording, it had to judge whether a request program could be recorded and had to set up a start and finish time of a request program, a broadcast channel etc.

[0004]When a program to appreciate was not able to be watched in real time simultaneously with broadcast, even if it got to know after broadcasting existence of a program [ obtains program information a priori and needs to set up VTR and ] to appreciate, there was no way which a program appreciates unless rebroadcasting etc. are carried out.

[0005]Since the conventional VTR exists outside the limit of a broadcasting system, recording, playback etc. have been performed by user initiative.

[0006]

[Problem to be solved by the invention]In order to record a program conventionally, when information including the broadcasting hours of the program etc. came to hand a priori, and complicated operation of performing various setting out was required and was not able to obtain the above-mentioned information a priori, reservation of picture recording was not able to be carried out. It was impossible to have made intention, such as a program information maker or a broadcasting organization, reflect in the processing or operation about a program by the side of this addressee.

[0007]This invention was made in consideration of the above-mentioned situation and obtains the information about a program a priori and the necessity for the complicated reserving operation of performing various setting out is abolished. And it aims at providing the program information recording device and program information record method which make it possible to prevent overlooking a desired program.

[0008]An object of this invention is to provide the program information recording device and program information record method which make it possible to make not only a user's demand but intention, such as a program information maker or a broadcasting organization, reflect in the processing or operation about a program by the side of an addressee.

[0009]

[Means for solving problem]As for this invention (Claim 1) this invention is characterized by that the received program information recording device which all records some programs automatically comprises the following.

The priority determining means used as the candidate for automatic recording which determines the priority for every program.

The recording device which records the program used as said candidate for automatic recording.

The control means processed for reducing the record data volume in said recording device to predetermined timing based on said priority to the program recorded on said recording device.

[0010]It may be made for said priority determining means to determine said priority preferably based on the personal information registered beforehand.

[0011]It may be made for said priority determining means to determine said priority preferably based on the additional information over a program provided from the broadcasting station side and the personal information registered beforehand.

[0012>About the program with which it is satisfied of the conditions defined beforehand preferably said priority determining means. It may be made to give the priority which shows that it forbids performing data conversion processing accompanied by reduction of deleting from said recording device in the processing for reducing said record data volume and data volume.

[0013>About the program by which recording reservation was carried out based on a user's operation preferably said priority determining means. It may be made to give the priority which shows that it forbids performing data conversion processing accompanied by reduction of deleting from said recording device in the processing for reducing said record data volume and data volume.

[0014]For example when a user performs recording reservation of the program to record automatically based on an electronic or un-electronic program information guide The priority of this program can be set as the value which does not allow also low-resolution-izing the contents of program data or any eliminating either and the program information total number of the record time can guarantee saving the information quality of this reservation program as a thing of a broadcast tense this by being reduced by this reservation program.

[0015]Said control means does not process to the program which has the 1st priority among the programs recorded on said recording device but performs data conversion processing accompanied by reduction in data volume to a program with the 2nd priority and it may be made to delete this about a program with the 3rd priority preferably.

[0016]While updating preferably the priority of the program which performed data conversion processing accompanied by reduction in data volume to the 3rd priority it may be made to update the priority of the eliminated program to the 4th priority.

[0017]It may be made for said predetermined timing to be the timing from which it was detected that the remaining recordable data volume in said recording device was less than the basis defined beforehand preferably.

[0018]When the program which is equivalent to the program which was the target of said automatic recording preferably is already recorded on said recording device it may be made to except from the object of automatic recording of this

program.

[0019]As for this invention (Claim 10)this invention is characterized by that the program information recording device which receives and records the program constituted by two or more partial programs comprises the following.

Information about the contents of the partial program with this specific program broadcast in advance of broadcast of the program of a broadcast schedule.

Information about the contents of the partial program with other specific programs already recorded.

A means to extract the specific partial program in which the conditions about this personal information are satisfied best based on the personal information registered beforehand.

When said extracted specific partial program is what constitutes the program of said broadcast scheduleA means to output as it is when the program of this broadcast schedule is receivedand to substitute the portion which corresponds when said extracted specific partial program is what constitutes said program of the others already recordedand the program of this broadcast schedule is received for said extracted specific partial programand to output it.

[0020]As for this invention (Claim 11)this invention is characterized by that the program information recording device which receives and records the program constituted by two or more partial programs comprises the following.

Information about the contents of the partial program with this specific program broadcast in advance of broadcast of the program of a broadcast schedule.

Information about the contents of the specific partial program for [ each ] substitution added to one or more specific partial programs for substitution over the partial program of this specification broadcast in advance of broadcast of this program.

A means to extract the specific partial program in which the conditions about this personal information are satisfied best based on the personal information registered beforehand.

When said extracted specific partial program is what constitutes the program of said broadcast scheduleA means to substitute a portion applicable when it outputted as it is when the program of this broadcast schedule was receivedand said extracted specific partial program is a specific partial program for [ said ] substitution and the program of this broadcast schedule is received for the specific partial program for said extracted substitutionand to output it.

[0021]This invention (Claim 12) records the program which is the received program information record method which all records some programs automaticallyand became a candidate for automatic recording and which determined the priority for every program and became a candidate for automatic recordingand is predetermined timingIt processes for reducing the record data volume in said recording device based on said priority to the program recorded on said recording device.

[0022]This invention concerning equipment is materialized also as invention concerning a method and this invention concerning a method is materialized also as invention concerning equipment.

[0023]In order that this invention concerning equipment or a method may make a computer perform a procedure equivalent to the invention concerned (or for operating a computer as a means equivalent to the invention concerned) Or it is materialized also as a recording medium which recorded a program for realizing a function equivalent to the invention concerned on a computer and in which computer reading is possible.

[0024]according to this invention it is ability ready for receiving in a place and constraints on which this equipment was put while all recording some programs automatically Since a priority is given for every program and the amount of stored data of a memory measure is suitably adjusted based on a priority of this program while abolishing the necessity for complicated reserving operation of information about a program coming to hand a priori and performing various setting out it can prevent overlooking a desired program.

[0025]According to this invention offer of various expressive media of a program for example an effective advertisement etc. is enabled by distributing automatically by demand of intention such as a program information maker or a broadcasting organization and a user.

[0026]

[Mode for carrying out the invention] Hereafter an embodiment of the invention is described referring to Drawings.

[0027]Roughly about the received program while this embodiment records the all or part (for example thing which fulfills certain conditions) once they are elimination or a thing which carries out data changing (for example the data conversion to which resolution is reduced to which it is supposed that the thing accompanied by reduction in data volume is meant corresponds to this) selectively about the program recorded based on the received priority which is given for every program.

[0028]by this embodiment a user (receiving side user) is natural — it can view and listen now also about the program under broadcast and the program already broadcast even if it not only can view and listen to the program recording which carried out reservation of picture recording (recording reservation) (when providing a reserving function) but did not carry out reservation of picture recording (recording reservation) specially.

[0029]Although explained below focusing on the dynamic image information which is the substance of a program when a voice information follows on dynamic image information a voice information shall be related with dynamic image information and record processing voice response etc. shall be carried out.

[0030]The example of composition of the program information recording device concerning one embodiment of this invention is shown in drawing 1. This program information recording device 1 is provided with the receipt information analyzing parts 2 the accumulation information Management Department 3 the transmission control part 4 the personal-information-management department 5 the program

information Management Department 6the program information Records  
Department 7and the program generation part 8. In drawing 1a thick line shows  
dynamic image information and a small-gage wire shows information other than  
dynamic image information (drawing 8drawing 9and drawing 12 are also the same).

[0031]Firstbroadcast information received via the broadcasting signal transmission  
line 9 is explained.

[0032]Broadcast information includes standard dynamic image information (main  
stream) of a digital broadcasting programand other information (substream).

[0033]Additional information for roughly dividing into a substream and transmitting  
additional information over a specific program to it. There is independent  
information used for the other purposesuch as (for exampleinformation which  
becomes an index of the programpossible information on a certain control to the  
program in a receiver being presentedintroductory information of the programetc.).  
Independent information may be dynamic image information (or Still Picture Sub-  
Division). Although the main portion is not picture informationthere is the above-  
mentioned additional informationalso when [ that ] a part is used and it includes  
dynamic image information (or Still Picture Sub-Division). It may be broadcast  
asynchronously that a specific main stream (program) and a substream with  
relation are the cases where it is broadcast synchronizing with the related  
program.

[0034]Although dynamic image information (program data) which is the substance  
which constitutes a program is broadcast as a main stream as mentioned  
aboveprogram data may be broadcast auxiliary by substream as independent  
information. In this caseprogram data broadcast by substream carries out how use  
of being used as some substituted parts of a main stream etc. is carried out for  
example.

[0035]Distinction of a main stream and a substream and classification of a  
substream make specification possible at identification information in a headerfor  
example. A certain substream enables specification of a main stream with  
relationfor example by link information in a header of the substream.

[0036]Nextprogram information is explained.

[0037]From the broadcasting station sideprogram information of each program  
created by a program information maker or a broadcasting organization other than  
dynamic image information (program data) etc. who is the substance which  
constitutes a program is broadcast (there may also be a program it is not  
broadcast that program information is).

[0038]Fundamental information required for reception of a broadcast area of the  
programstart timefinish timeetc. and-like secondary information with which  
program introductionprogram retrievingetc. by the side of a user can be presented  
like a program content (kind of program)a performerand a keyword are included in  
program informationfor example. Each item within program information illustrated  
above shall be coded. Although mentioned later in detailinformation on a sending-  
area set priority which a program information maker or a broadcasting organization  
defined shall be added to program information.



[0039]A main stream this program information by for example a case where it is added to a header part etc. and broadcast and a substream as the above-mentioned additional information. it may be broadcast by a program and asynchronous synchronizing with a program (for example just before a program start of each program) (for example it is individually to suitable timing before a program start -- being and collecting by No. two or more group).

[0040]Conversely when it says there are a thing containing both program information and program data and a thing which does not include program information in a main stream.

[0041]The information (for example the same program ID) that the main stream corresponding to the header part can be specified shall be described by the program information broadcast by the substream for example.

[0042]Next the outline of the program generation part 8 and the digital television machine 10 is explained from the receipt information analyzing parts 2 respectively.

[0043]The receipt information analyzing parts 2 receive broadcast information via the broadcasting signal transmission line 9. For example based on the header part analyze the received broadcast information and this is passed to the program information Records Department 7 about program data (when there is a viewing- and-listening demand of the program under broadcast from a user it is delivery also to the program generation part 8). This is passed to the program information Management Department 6 about program information (that is notified when program information is not added to the received program data).

[0044]The program information Records Department 7 receives program data from the receipt information analyzing parts 2 and accumulates this. Here all or a part of program receivable under the constraints of the place (that is it is a place applicable to the area where a certain program is broadcast or not?) on which the equipment concerned was put or others will be recorded automatically.

[0045]As a form which records a part of receivable program. For example program information records selectively the program which is in agreement with the conditions set up beforehand. (For example only the program which records only the program applicable to a drama and a musical program and on which a specific performer appears is recorded) There are various forms such as a method and the method of recording selectively only the program broadcast in a specific time zone.

[0046]It is desirable when a specific main stream and a substream with relation may be broadcast except program information and it matches and records automatically on the main stream to which such a substream also relates. As for the priority of such a substream it is preferred to hold the same thing as a related main stream.

[0047]While supervising the remaining data volume recordable on the program information Records Department 7 to predetermined timing the accumulation information Management Department 3. When it is detected that recordable data volume was less than the basis defined beforehand the program recorded based on the priority of each program for the purpose of securing this basis as recordable data volume -- alternative -- elimination -- or data changing is carried out (in

addition) While supervising the data accumulation amount of the program information Records Department 7 to predetermined timing when it is detected that the data accumulation amount reached the basis defined beforehand the program which recorded the data accumulation amount based on the priority of each program for the purpose of using this below basis -- alternative -- elimination -- or it is equivalent even if it is made to carry out data changing.

[0048] The personal-information-management department 5 manages personal information peculiar to each user. The peculiar information about equipment itself [ concerned ] shall be managed in the personal-information-management department 5. The information on ages, sex, taste, an inhabitable area, etc. is included in personal information for example.

[0049] The program information Management Department 6 creates and manages the program information index later mentioned based on program information for every program. Information including a program content (kind of program), broadcasting hours (start time, finish time), a performer, a keyword, etc. is included in a program information index for example. A program information index can be used for example when showing a user the table of the information about a program or when a user does key search of the program.

[0050] The program information Management Department 6 considers this when the information on a sending-area set priority is further included in program information based on program information and personal information (comparison, etc.) in the case of creation of a program information index and it gives a priority to each program. The information on a priority is held as a part of program information index.

[0051] Although mentioned later in detail, 1 or two or more levels which forbid automatic elimination and data changing (low-resolution-izing, etc.) to a priority for example and 1 or two or more levels which permit automatic elimination and data changing (low-resolution-izing, etc.) are formed.

[0052] It is desirable when it enables it to change the priority of the program suitably after record of program data based on a user's operation.

[0053] Although program information and a program information index may be accumulated in the program information Records Department part 6 or may be accumulated in the program information Records Department part 7, below they are explained as what is accumulated in the program information Records Department part 6.

[0054] The transmission control part 4 receives the demand from a user via the digital television machine 10 and performs control according to the demand from this user. For example, so that the program for which the user is asking may be passed to the program generation part 8 when the viewing-and-listening demand to the program recorded from the user is received (in order to distribute to the digital television machine 10). When it points to the program information Records Department 7 and the viewing-and-listening demand to the program under broadcast from a user is received, it directs to the receipt information analyzing parts 2 so that the received program may be passed to the program generation

part 8 (in order to distribute to the digital television machine 10).

[0055]The program generation part 8 changes the program data passed ignited by the viewing-and-listening demand emitted by the above-mentioned user from the program information Records Department 7 or the receipt information analyzing parts 2 into a suitable form which can display the digital television machine 10and distributes it to the digital television machine 10.

[0056]The digital television machine 10 displays the program data from the program information recording device 1.

[0057]Although a function of a user interface to the program information recording device 1 was provided in the digital television machine 10 sideit may be made to provide a function of a user interface in program information recording device 1 self in the above.

[0058]It may be made for a reservation-of-picture-recording function (recording reservation function) to provide thisand may be made not to provide it.

[0059]Nextoutline operation about automatic recording of the program information recording device 1 concerning this embodiment is explained.

[0060]Received program data (all or in part) is recorded automatically on the program information Records Department 7 one after another.

[0061]It combines with thisand while it is asynchronous and received program information is also recorded on the program information Records Department 7 one after another synchronizing with program dataa program information index of each program is created by the program information Management Department 6and this is recorded on the program information Management Department 6 (the program information Records Department 7 may be sufficient). A priority included in a program information index is determined based on program informationpersonal informationand information of a sending-area set priorityfor example.

[0062]On the other handsince the remaining data volume that can record the program information Records Department 7 decreases if program data is recorded automatically on the program information Records Department 7 one after anotherat the accumulation information Management Department 3alternative elimination or data changing in a program unit based on a priority of a program is performed to predetermined timing.

[0063]And if the demand from a user is received via the digital television machine 10the dynamic image information of the appointed program will be passed to the program generation part 8 from the program information Records Department 7will be changed into a suitable form by the program generation part 8and will be distributed to the digital television machine 10 by control of the transmission control part 4.

[0064]By the waya user is preferredalthough he can view and listen to the program recorded automatically on the program information recording device 1 with the digital television machine 10in addition when various functions convenient for a user are provided.

[0065]For exampleit is desirable when the function to carry out the list display of

the program name etc. of the program recorded automatically according to the demand from the user to the digital television machine 10 by a character string is provided.

[0066]It is desirable when the function to reconstruct the program digest based on personal information about the program recorded automatically because a user specifies the total inspection time at the time of an inspection and to display this on the digital television machine 10 is provided.

[0067]moreover -- accepting the demand from a user about the program recorded automatically -- the beginning or a main scene of a program etc. -- a list of Still Picture Sub-Division -- ohit is desirable when the function for which what was carried out is displayed on the digital television machine 10 for example is provided.

[0068]the above -- when two or more inner arbitrary functions are provided and a user specifies the inspection method the total inspection time etc. it may enable it to peruse with the combination of one of the above-mentioned functions or two or more predetermined functions

[0069]When it points to a desired program about a documentary program table etc. which a user is displaying it may be made to be displayed on the digital television machine 10 in above each further again as that by which a viewing-and-listening demand was emitted to the program.

[0070]And these functions [ like ] are preferred when it realizes using a graphical user interface.

[0071]And desirable one is the same if such a function is provided also about a program recorded by recording reservation again when providing recording reservation.

[0072]It is desirable when it can be made to perform specification whether to carry out recording reservation about the contents recorded automatically.

[0073]Below a more detailed example of composition of this embodiment is explained.

[0074]First it explains in more detail about creation (determination of a priority is also included) of a program information index.

[0075]Broadcast information received via the broadcasting signal transmission line 9 is passed to the receipt information analyzing parts 2 and it is investigated in the receipt information analyzing parts 2 whether program information exists in a main stream or a substream.

[0076]When program information exists in a main stream or a substream that program information is passed to the program information Management Department 6 and index attachment is performed by this program information Management Department 6. That is based on a code described in program information a program information index used within the equipment concerned is created.

[0077]Among program information indexes using the code described in program information as it is it changes into a code thru/or text etc. within the equipment concerned or items other than a priority retrieve information required as a key and create the code described in program information.

[0078]A priority considers and determines intentionssuch as a program information maker or a broadcasting organizationfurther based on a user's personal information registered into the personal-information-management department 5.

[0079]For examplethe degree of coincidence of what is described in program information about 1 or two or more specific items (for examplea program contenta performeretc.)and the thing described in personal information is evaluatedand when the degree of coincidence is highthere are methodssuch as giving a high priority.

[0080]For examplewhen the sending-area set priority is described in program informationthere is the method of adopting the one where the priority determined based on this sending-area set priority and the above-mentioned personal information is higher.

[0081]For examplea user's specification of whether a sending-area set priority is considered can also be enabled.

[0082]It is good also as the ability of a user to be set up further again in the special conditions which should give the maximum priority. For examplethe maximum priority is altogether given about a program with a certain program contentfor examplethe program which give the maximum priority altogether about a dramaor is broadcast by a certain broadcasting-hours belt or it can consider it to be them to give a conversely low priority etc.

[0083]It may be made to give the maximum priority to a program recorded by reservation of picture recording (recording reservation).

[0084]Nowwhen program information is not added to a transmitted main stream on the other handthat is told to the program information Management Department 6 from the receipt information analyzing parts 2. In this casethe program information Management Department 6 has received program information over that main stream (namelythat program) in the pastand investigates whether a program information index is already created. And when not created yetthe program information Management Department 6 is a possible rangeand creates a program information index. For exampleprogram start timeprogram finish timeetc. are generable.

[0085]A method of setting it as a priority defined beforehand besides the method same about a priority in this case as a case where it describes aboveIt supposes that it is set as a priority which is not the maximum defined beforehand in principleand how to set up the maximum priority etc. can be considered about a program by which special conditions by which the user set was carried out are fulfilled.

[0086]A program information index is created as mentioned aboveand received program information and a created program information index are accumulated in the program information Management Department 6 (the program information Records Department 7 may be sufficient).

[0087]When program information is broadcast repeatedlyit will overlap and program information will be received. In this caseit investigates whether the program information of the same contents is already receivedand if receivedit will overlap

and will be made not to create a program information index. However when a part of program information has changed it is preferred to update only the portion which re-creates a program information index or corresponds.

[0088] It may be made to perform creation of the program information index to the program information which it was asynchronous to broadcast of the program and was received to it to the predetermined timing before [ instead of the time of reception of the program information ] the start of broadcast of a program.

[0089] Next personal information is explained.

[0090] As the personal information of the user of the equipment concerned and an example the data of age, sex, taste, an inhabitable area etc. is registered into the personal-information-management department 5. May make the user himself input the whole of this registration and about some of those data. This equipment acquires automatically (for example if there is another database it will search) Or by taking a user's past recording reservation history and program viewing history and analyzing and asking for this (for example the attribute which a user likes is extracted from the program information concerning a history) it is good also as registration being automatically possible.

[0091] An example of a personal information table is shown in drawing 2.

[0092] In an example of drawing 2 information of the equipment concerned and a three-person family is stored.

[0093] # 0 shows equipment itself [ concerned ] and equipment information: TSB1048 data format (for example animation format [ of MPEG 2 ] inhibition drawing format of JPEG etc.): M which can be received 2J 3C5 and setting position: TYOCHI are describing it.

[0094] # 1 to #3 shows a user of this equipment and interesting area: SPBAGY1DOANTG and EDCHXZ2 grade are describing it following sex age: M032W030 and M006. It is preferred that the coding as a program content in program information a performer a keyword etc. with interesting area same among these user data is made (it can compare an item within program information and directly).

[0095] When personal information divides and is managed for every user and personal information is referred to by the processing in the equipment concerned like the example of drawing 2 what took OR of the contents all the users' personal information about the item which should be referred to shall be used. Other methods may be used according to the purposes such as taking not OR but AND.

[0096] Next the example of composition of the program information Records Department 7 is explained.

[0097] The example of composition of the program information Records Department 7 is shown in drawing 3.

[0098] A magnetic disk drive, an optical disk unit etc. are combined independently and he uses as a storage medium (61-6N) and is trying to control a storage medium by the example of composition of drawing 3 by the processor 63. The program information total number of the record time is determined by the kind and number of these archive media.

[0099]Below the example of some processings is explained respectively.

[0100]Now at this embodiment while creation (priority attachment is also included) of a program information index and accumulation of program data are performed continuously or intermittently reduction processing of record data volume and the update process of the priority are performed to suitable timing. Hereafter the more detailed example of priority decision processing accumulation data volume reduction processing and a priority update process is explained in order.

[0101]First the example of the system of a priority is explained.

[0102]As mentioned above the priority determined by the program information Management Department 6 is added to the program information index to each program recorded.

[0103]In this example a priority conversion table which is illustrated to the accumulation information Management Department 3 at drawing 4 is provided and the program information Management Department 6 performs priority attachment according to this priority conversion table.

[0104]Here taking the case of the case where a priority is set as four steps it explains from A to D with the lowest priority with the highest priority.

[0105]The priority A is the highest priority defined by the equipment concerned and it is shown automatically elimination and that-izing cannot be carried out [ low resolution ]. This priority A shall be given only to a program by which some conditions are fulfilled. For example they are a program containing a code registered into an interesting area of a user's personal information a program in which a user did recording reservation clearly the program a sending-area set priority which shows the priority A to program information is described to be etc.

[0106]The priority B is the highest thing among priorities which can be made into an accumulation data volume elimination object of the program information Records Department 7 and it is shown that it can more specifically low-resolution-ize automatically. This priority B is given to other programs by which conditions to which the priority A is given in the case of automatic program record for example are not fulfilled.

[0107]It is shown that the priority C is attached to a program (namely program which was the priority B) automatically low-resolution-ized by the equipment concerned and can be eliminated automatically.

[0108]The priority D is attached to program information (namely program which was the priority C) of a program eliminated automatically. That is although the contents of a program which was the priority C themselves are eliminated elimination program information for getting to know an eliminated program is recorded and the priority D is given to this elimination program information.

[0109]Next the example of priority determination is explained.

[0110]An example of the priority decision processing procedure by the program information Management Department 6 is shown in drawing 5.

[0111]Here it is premised on the system of the priority of above-mentioned drawing 4. It is an example in consideration of the sending-area set priority added

by a program information maker or broadcasting organization.

[0112]First the sending-area set priority added by a program information maker or broadcasting organization is detected from program information (Step 11).

[0113]When a sending-area set priority is what shows A of the topmost peg the priority in the equipment concerned of this program is set to A (Step 12).

[0114]Personal information is referred to when a sending-area set priority is not what shows A of the topmost peg (this shall include the case where the sending-area set priority is not described) (Step 13). And whether the code registered into the interesting area is described in program information investigates (Step 14) and when described. When it is judged as the thing applicable to a user's interesting program a priority is set to A (Step 15) and it is not described it judges that it does not correspond to a user's interesting program and a priority is set to B (Step 16).

[0115]As the method of judgment whether each program corresponds to a user's interesting program various modification is possible.

[0116]Next the processing which reduces the accumulation data volume of the program information Records Department 7 is explained.

[0117]An example of the accumulation data volume reduction procedure by the accumulation information Management Department 3 is shown in drawing 6.

[0118]Here it is premised on the system of the priority of above-mentioned drawing 4.

[0119]The accumulation information Management Department 3 is measuring the program information total recordable time in the program information Records Department 7 to predetermined timing (Step S21).

[0120]As predetermined timing various methods such as the method of performing periodically for every fixed time independently and the method of performing ignited by the specific event in automatic recording having occurred can be considered to be automatic recording.

[0121]When the measured program information total recordable time is less than threshold value time T2 set up beforehand (Step S22) the information resolution of the program data of the priority B is reduced (Step S23). For example when program information is video the compression ratio of the graphical-data-compression algorithm represented by MPEG is made higher or video resolution is reduced.

[0122]When the measured above-mentioned program information total recordable time is less than threshold value time T1 set up beforehand (Step S23) the program data of the priority C is eliminated (Step S23). However it is  $T1 < T2$ .

[0123]It may be made to perform processing of low-resolution-izing of program data in the program information Records Department 7 (for example processor 63 of drawing 3) and may be made to carry out at the accumulation information Management Department 3 concerned.

[0124]Next an example of the priority update process performed after the above-mentioned accumulation data volume reduction processing is shown.

[0125]An example of the priority update process procedure followed after the above-mentioned accumulation data volume reduction processing is shown in



drawing 7.

[0126]Here it is premised on a system of a priority of above-mentioned drawing 4.

[0127]A priority and a recorded state of program data are associated in an example of drawing 4. Therefore after performing the above-mentioned accumulation data volume reduction processing it is necessary to derate elimination or a low-resolution-ized priority of a program to a priority of one low rank.

[0128]Namely if the priority is investigated (Step S31) and a priority of the program A Becomes about each recorded program If it leaves as it is (Step S32) and a priority C Becomes it will lower to the priority D (Step S33S34) and if a priority B Becomes it will lower to the priority C (Step S35S36).

[0129]It is also possible to look over again a priority of all the program information further accumulated in the program information Records Department 7 independently of low-resolution-izing of program data or elimination. When a standard of reexamination is made into time for example inside of program data other than the priority A Rather than this time about what is a front beyond as for fixed time recorded time lowers one priority rather than a priority in this time or lowers 1 or or more 2 priority by width according to a size of difference of recorded time and this time respectively.

[0130]Below some modifications of the composition of the program information recording device concerning this embodiment are explained.

[0131]The program information recording device concerning other examples of composition is shown in drawing 8. Each block of drawing 8 has the fundamentally same function as each block of the same name of drawing 1.

[0132]Drawing 8 is that to which the program information recording device 21 used the program information Records Department 27 as the recording equipment (20) of another case and can realize the same function as drawing 1 by connecting between these via a network by the network I/F part 208 and the network I/F part 209.

[0133]A program information recording device (digital receiving set) concerning an example of composition of further others is shown in drawing 8. Each block of drawing 9 has the fundamentally same function as each block of a same name of drawing 1.

[0134]Drawing 9 is what mounted each block in a program information recording device of drawing 1 in a digital receiving set (namely thing to which each block in a program information recording device of drawing 1 and the digital television machine 31 exist in the same case) and can realize the same function as drawing 1 also by this.

[0135]Also in drawing 9 the program information Records Department may be made external like drawing 8. Next an example of the processing which a user performs as a modification of priority decision processing by taking into consideration whether it is the program which carried out recording reservation is explained.

[0136]Although explained focusing on priority attachment to the program data recorded automatically until now the case where the user has performed recording

reservation beforehand based on the electronic or un-electronic program information guide is assumed. In such a case program data sets the priority of applicable program data as the value which allows neither low-resolution-izing nor elimination to be carried out automatically and carries out it the outside of the object of priority reexamination.

[0137] An example of this priority decision processing procedure is shown in drawing 10.

[0138] Here it explains taking the case of a case where a system of a priority of drawing 4 is used.

[0139] An electronic program information guide represented by EPG (Electronic Program Guide) Or when a user does recording reservation to the equipment concerned based on a program information guide of un-electronic media such as a newspaper magazine information on a program by which recording reservation was carried out is saved at the program information Management Department 6 (Step S41).

[0140] In the receipt information analyzing parts 2 when program data is received it is investigated whether it corresponds in a recording reservation program [ the program ] based on the above-mentioned information saved at the program information Management Department 6 beforehand (Step S42).

[0141] A priority is set to the top A when a received program corresponds to a program by which recording reservation is carried out (Step S43) (Step S44). On the other hand a priority is set to B when a received program does not correspond to a program by which recording reservation is carried out (Step S43) (Step S45).

[0142] And program data is recorded automatically (Step S43).

[0143] Thus by setting only the priority of the program by which recording reservation was carried out to the user as A of a peak price After being recorded automatically about the program by which recording reservation is not carried out it can guarantee saving information quality as a thing of a broadcast tense this only about low-resolution-izing or the program by which recording reservation was deleted and carried out.

[0144] About the program to which the priority A was given by the user's recording reservation. For example when the directions which save a program are not made one step of priorities of this program are lowered and it may be made to display the message of whether to save a program for example and to consider it when a user emits the viewing-and-listening demand to this program and the appreciation is completed as the priority B. The program which does not need to be saved by this although recording reservation was carried out can be set as the object of priority reexamination.

[0145] Next a user explains other examples of processing in consideration of whether it is the program which carried out recording reservation.

[0146] Addition of the sending-area set priority which a program information maker or a broadcasting organization determines to program information mentioned above can be enabled. Then while a user takes into consideration whether it is the program which carried out recording reservation how to consider a sending-area

set priority and to determine a priority can be considered.

[0147]An example of this priority decision processing procedure is shown in drawing 11. This procedure also considers a sending-area set priority in a procedure of drawing 10.

[0148]That is a sending-area set priority of a received program is investigated (Step S51) and when this sending-area set priority is what shows the priority A (Step S52) and the priority A are given (Step S54).

[0149]On the other hand when a sending-area set priority is not what shows the priority A (Step S53) a priority will be set to B if a program which set a priority to the top A (Step S54) and was received if a received program corresponded to a program by which recording reservation is carried out like drawing 10 (Step S53) does not correspond to a program by which recording reservation is carried out (Step S54) (Step S55).

[0150]That is a procedure of drawing 11 makes the one where the degree of sending-area A setting-out place and a user set priority are higher a priority of this program.

[0151]Next a program information processor concerning other embodiments of this invention is explained.

[0152]An example of composition of acting-before-the-audience group Information Storage Division equipment is shown in drawing 12. Each block of drawing 12 has the fundamentally same function as each block of a same name of drawing 1.

[0153]This embodiment performs processing for coping with duplication recording.

[0154]The program information which shows the contents of the program etc. is added to the main stream which receives or program information is acquired by the substream as a thing independent of a main stream.

[0155]Drawing 13 shows the case where program information is describing at the header part of program data. As program information where a broadcast area start time finish time a program content a performer a recording format etc. are symbolized it is described by the header unit 100. In the example of drawing 13 broadcast area: JPN02063 start time: 97010120 finish time: 97010204 program content: SPBAGY1 priority: 25687432 recording format: MPG2HI The main performers: It is indicated to the header unit like TKIMG place: TYOCHI and number-of-times of broadcast: C1203.

[0156]On the other hand as for the main stream drawing 14 shows an example of the format of the program information broadcast independently. As program information where a broadcast area start time finish time a program content a performer a recording format etc. are symbolized it is described. Header: AIB which shows an additional information start in the example of drawing 14 Object sex and age : M2040 number-of-times of broadcast: C1203 broadcast area: JPN02063 start time: 97010120 finish time: 97010204 program content: SPBAGY1 priority: 25687432 recording format: MPG2HI The main performers: It is indicated to the header unit like TKIMG place: TYOCHI and header: AIE that shows the end of additional information.

[0157]The program information index created the program information of the program data accumulated in the program information Records Department 87 and based on this is held at the program information Management Department 86 (good as for the program information Records Department 87)In the program information analyzing parts 82collation based on program information or a program information index is performed.

[0158]An example of the collation processing procedure of the program information in this embodiment is shown in drawing 15.

[0159]The program information which detected the program information of the program used as a collation processing object (Step S61)and was detectedWhen the program information of the program already recorded is compared (Step S62) and informationincluding a program contenta performerand a recording formatpeculiar to a program content is in agreement(Step S63) and the program concerned are judged to be what is already recordedAutomatic recording is stopped and the program data recorded automatically while performing detection and collation is eliminated (Step S64). And program information and a program information index are updated if needed (Step S65). For examplethe information about program broadcastssuch as a broadcast areastart timeand finish timeis updated as contents of the program broadcast now among the contents of the program information index of the program recorded before.

[0160]On the other handwhen informationincluding a program contenta performerand a recording formatpeculiar to a program content is not in agreement(Step S63) and automatic recording are continued (Step S66).

[0161]Therebywhen multiple-times broadcast of the programs of the contentssuch as a rebroadcast programis carried outfor exampleit can avoid overlapping and recording them.

[0162]The above-mentioned composition is applicable also to the program information recording device explained by drawing 1drawing 8drawing 9etc.or its modification.

[0163]Nextthe program information processor concerning the embodiment of further others of this invention is explained.

[0164]In the program information recording device explained by drawing 1this embodiment makes it possible to substitute some contents of the program.

[0165]nowprogram information offer which overemphasized more the information of the program information which geographical or a difference produces in value in time or individuallyfor examplecommercials and a weather reportin individual needs and the area -- \*\*\*\* -- better -- \*\*.

[0166]Firstit explains taking the case of the case where commercials are put and replacedreferring to drawing 16.

[0167]As shown in drawing 16 (a)two CMs (4243) shall be contained in a program stream (41).

[0168]Herebefore each commercials (4243) are broadcastthe warning information over these each shall be broadcast by the substorm as independent informationand shall be received. The information about sexagetastethe areaetc. is

described by warning information.

[0169]An example of commercial substitution procedure is shown in drawing 17.

[0170]Reception of this warning information will extract the warning information of the commercials contained in the program already accumulated in the program information Records Department 7 (Step S71). (if warning information is extracted by the receipt information analyzing parts 2)

[0171]Heresince it is not necessary to substitute commercials if this warning information satisfies the conditions of a user's sexagetastethe areaetc.not substituting commercials is determined.

[0172]As information used as the basis of the conditions of a user's sexagetastethe areaetc.a user's personal information registered into the personal-information-management department 5 can be usedfor example. A user may use the information directed specially separately.

[0173]Nextwhen this warning information does not fulfill conditiontime length of received warning information and extracted warning information is compared first (Step S72)and it is investigated whether there are any commercials of the same time length.

[0174]Not substituting commercials will be determined if there are no commercials of the same time length in what was already recorded.

[0175]If there are the same time length's commercialscommercials which are in agreement by conditions of a user's sexagetastethe areaetc. will be compared about each warning information.

[0176]By drawing 17when there were a user's sexagetasteand a thing that satisfies all conditions of the area among already memorized commercialsan example whose (Step S72-S76) and these commercials substitute (Step S77) and which was made like was shownbut. When the evaluation value b to the above-mentioned conditions of warning information of commercials which are already recorded as the evaluation value a to the above-mentioned conditions of warning information of commercials of a direction broadcast in real timeand are is compared and the evaluation value b exceeds the evaluation value ait may be made to substitute commercials. The degree of coincidence etc. which were called for as an evaluation value by the number of things congruous among itemssuch as sex and ageor a predetermined valuation functionfor example can be considered.

[0177]If the commercials accumulated are chosen as a result of comparison of the warning information of commercialscommercials are substitutable by the commercial program for substitution accumulated being sent to the program generation part 8 at the time of the commercial broadcast for substitution.

[0178]When the commercials of the direction broadcast in real time are chosen as a result of comparison with the commercials recorded [ one ] (when not substituting is determined)When only an accumulation program number or a prescribed number time repeats comparison and an accumulation program is not chosen by this in comparison with other commercial information accumulatedeitherthe commercials broadcast in real time are displayed as it is.

[0179]"Personal computer CM" (43') which is the same time length as

"refrigerator CM" (43) of drawing 16 (a) is beforehand accumulated in the program information Records Department 7 via the main stream or substream of a broadcast wave. Since the latter won by all the relation condition as a result of comparison with the warning information of "refrigerator CM43" and the program information of accumulated "personal computer CM43'" as shown in drawing 16 (b), personal computer CM(43') is substituted for the program frame of "refrigerator CM (43)."

[0180] In such substitution of a commercial program being carried out on condition that it is the commercials which commercial donor same in addition to conditionssuch as personal information and program timeprovides is also considered. Thereby a commercial donor becomes possible [ performing a more effective advertisement ].

[0181] Next it explains taking the case of a case where a weather forecast program is put and replaced referring to drawing 18.

[0182] An example of weather forecast program substitution procedure is shown in drawing 18.

[0183] Before a weather forecast program by a main stream is broadcast a weather forecast program (dynamic image information) of an every place region shall be broadcast and received via a substream as independent information. The same coding as a format of program information illustrated also to a weather forecast program at drawing 13 shall be made.

[0184] The weather forecast program (extracted by the receipt information analyzing parts 2) received via the substream shall be accumulated in the program information Records Department 7. A weather forecast program shall be geographically sorted and recorded on the area (for example area information included in the equipment information registered into the personal-information-management department 5) on which the equipment concerned was put based on the area information of each weather forecast program by near order in the program information Records Department 7.

[0185] Before a weather report is broadcast in the program of the real time through a main stream Not substituting will be determined if the warning information of the weather report is broadcast via a substream (if extracted by the receipt information analyzing parts 2) (Step S81) and the area information described by the warning information is in agreement with the area on which the equipment concerned was put.

[0186] On the other hand if not in agreement it will shift to the processing which chooses what was most suitable among the weather report in a real-time program and the already accumulated weather report.

[0187] First the weather report already recorded is chosen as a sort order and the time when the weather report of (Step 82) and both was forecast by the area on which the equipment concerned was put when near is compared to a weather report [ in / in this / a real-time program ].

[0188] If predicted time is within the limits of the threshold value set up beforehand (Step S83) next the time length of both program will be compared.

[0189]When it is the same time length it shifts to (Step S84) and program substitution procedure (Step S86). When time length differs according to (Step S84) and the time frame of real time broadcasting extension of an accumulation program or processing of shortening is performed (Step S85) and it shifts to program substitution procedure (Step S84).

[0190]When the weather report of the direction broadcast in real time is chosen as a result of comparison with the weather report recorded [ one ] (when not substituting is determined) When only an accumulation program number or a prescribed number time repeats comparison and an accumulation program is not chosen by this in comparison with other weather reports accumulated either the weather report broadcast in real time is displayed as it is.

[0191]The area information saved in the personal-information-management department 5 is good also as setting out by a user being possible besides the place in which the equipment concerned is located geographically. For example when two areas are set up The above-mentioned processing shortens and substitutes weather forecast program 2 accumulated duty for the time frame of a real-time weather forecast program about each area in the case of a line crack and program substitution or a display screen is divided into two and the method of displaying two weather forecast programs simultaneously is taken.

[0192]Specification of 1 or two or more areas by a user is replaced with the area information saved in the personal-information-management department 5 when it receives and the area is separately specified from the user and it may be made to choose the weather report for which it was most suitable based on the information on the area specified by the user.

[0193]This composition is applicable also to the program information recording device explained by drawing 8 drawing 9 drawing 12 etc. or its modification.

[0194]Each above function is realizable also as software.

[0195]In order that this embodiment may make a computer perform a predetermined procedure (or for operating a computer as a predetermined means) Or it can also carry out as a recording medium which recorded a program for realizing a predetermined function on a computer and in which computer reading is possible.

[0196]This invention is not limited to an embodiment mentioned above in the technical scope can change variously and can be carried out.

[0197]

[Effect of the Invention]According to this invention the received program of the request recorded automatically even if the user did not perform reserving operations since the priority was given for every program and the amount of stored data of the memory measure was suitably adjusted based on the priority of this program while all recording some programs automatically can be appreciated.

[0198]According to this invention offer of the various expressive media of a program for example an effective advertisement etc. is enabled by distributing automatically by demand of intention such as a program information maker or a

broadcasting organization and a user.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The figure showing the example of composition of the program information recording device concerning one embodiment of this invention

[Drawing 2] The figure showing an example of a personal information table

[Drawing 3] The figure showing the example of composition of a program information recording device

[Drawing 4] The figure showing an example of a priority conversion table

[Drawing 5] The flow chart which shows an example of a priority decision procedure

[Drawing 6] The flow chart which shows an example of an information storage partitioning procedure

[Drawing 7] The flow chart which shows an example of a priority modification procedure

[Drawing 8] The figure showing the example of composition of a program information recording device

[Drawing 9] The figure showing the example of composition of a digital television machine

[Drawing 10] The flow chart which shows an example of reservation program priority setup steps

[Drawing 11] The flow chart which shows an example of priority setup steps

[Drawing 12] The figure showing the example of composition of a program information recording device

[Drawing 13] The figure showing an example of a program information format

[Drawing 14] The figure showing an example of an additional information format

[Drawing 15] The flow chart which shows an example of an automatic-recording stop

[Drawing 16] The figure showing program substitution typically

[Drawing 17] The flow chart which shows an example of a CM program substitution procedure

[Drawing 18] The flow chart which shows an example of a weather forecast program substitution procedure

[Explanations of letters or numerals]

1213181 -- Program information recording device

2223282 -- Receipt information analyzing parts

3233383 -- Accumulation information Management Department

4243484 -- Transmission control part

52535 -- Personal-information-management department

6263686 -- Program information Management Department

7273787 -- Program information Records Department



8283888 -- Program generation part  
9 -- Broadcasting signal transmission line  
10 -- Digital television machine  
20 -- Recording equipment  
30 -- Television part  
208209 -- Network I/F part  
61626N -- Storage medium  
63 -- Processor

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